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## NESTING OF THE DUCK HAWK IN TENNESSEE

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If one were asked to name the most spectacular and romantic of our native birds he might readily defend the choice of the Duck Hawk, our counterpart of the Peregrine Falcon, that most favored bird among the falconers of mediaeval Europe. At one time widely distributed throughout the United States, this bird, chiefly through boldness in defense of its nest, has become nearly exterminated in all that area which lies between New England and the Rockies. A bold brigand, a courageous parent, a paragon in the art of flight, trim and handsome, he is a proud untamed aborigine making his last stand in the very few rugged unsettled places that remain in our land.

On April 7, 1929, I discovered a nest of the Peregrine Falcon (*Falco peregrinus anatum*) in a cliff on the slope of Mt. LeConte, in the Great Smoky Mountains near Gatlinburg, Tennessee. The nest contained three eggs which I succeeded in collecting with the aid of a rope ladder and the assistance of Mr. Brockway Crouch of Knoxville, who accompanied me. In preparing the eggs I found that incubation was advanced, varying from 14 to 17 days; therefore, the bird had evidently begun to set about March 20 with the laying of the first egg.

The site was in the Devil's Backbone cliff, a promontory or comb with a sheer drop of 150 feet on one side, nearly vertical on the other and having practically no width at its apex. This site had been in use for years no doubt and was first found by me on May 31, 1925, at which time there were unmistakable evidences of occupation. A shelf about twelve feet long and fifteen feet below the top, on the vertical side, was chosen. It was triangle shaped, about five feet wide at the center, at which point there was a little cave-like pocket, while at the ends it feathered out to nothing and so was inaccessible to prowling animals. A few small bushes grew at either end of the shelf and also some rank grass, now prostrate and dry. The surface was covered by fine shale and in a depression in this material, near the center and a foot from the wall, the three eggs were found. There were bits of

down from the bird's body as well as numerous feathers of such small birds as robins, thrushes, jays, and juncos, scattered about the shelf. By the eggs were two pellets composed of hair and feathers and measuring  $\frac{3}{4} \times 2\frac{1}{4}$  inches. There were four or five deposits of white excreta near the nest and also on nearby sheltered ledges, where the birds were in the habit of perching or roosting. On the top of the rocky backbone of the cliff there was no growth except occasional clumps of sand myrtle and here also were found pellets, excreta, and feathers. The vertebra of a small snake was on the nesting ledge.

The conduct of the falcons about the nest was similar to that described by other observers. Our first view of them was from the forest 600 feet below, when the two were seen flying about the cliff. One of the birds finally began to fly in closely, with rapid beating wings, and a moment later I saw her alight on the nesting shelf. An hour's climbing through the jungle of laurel and rhododendron brought us out on top of the backbone which we followed in approaching the nesting site, keeping a close lookout the while for the departure of the sitting bird. The male had in the meantime disappeared. I stationed myself sixty feet from the shelf while my companion advanced to a point immediately above the brooding female. He struck the cliff face with a rock but the bird, hidden from sight, did not leave. He then pushed off a lump of loose shale with his foot and as it fell on the ledge, the sitting bird launched herself into space with rapid wing beats. She immediately began her eackling alarm notes and was joined, in less than a minute, by the male, a smaller bird. He remained high and did not join in the demonstration, leaving the scene in about five minutes. A short while later he returned for a few moments and then did not re-appear during the hour we were about the nest.

We tied the rope ladder to rhododendron bushes and went "over the top," seating ourselves a few feet from the eggs. All this time the female, which had been keeping up her demonstrations, now became more violent. She would approach from above with half folded wings, darting straight toward us but swerving suddenly upward or sideways when from forty to eighty feet away. The swish of her wings could be heard plainly as she turned, and her flight at this time was inconceivably rapid, making an audible roar. With a Leitz Leica camera, f. 3.5 lens and shutter set at  $\frac{1}{500}$  second, we made a number of pictures of the bird in flight. With different adjustments I photographed the nest with eggs and later photographed the cliff from different points. The falcon's contrasting head markings, the black tail, the slaty back and the black and white breast bars, were plainly visible.

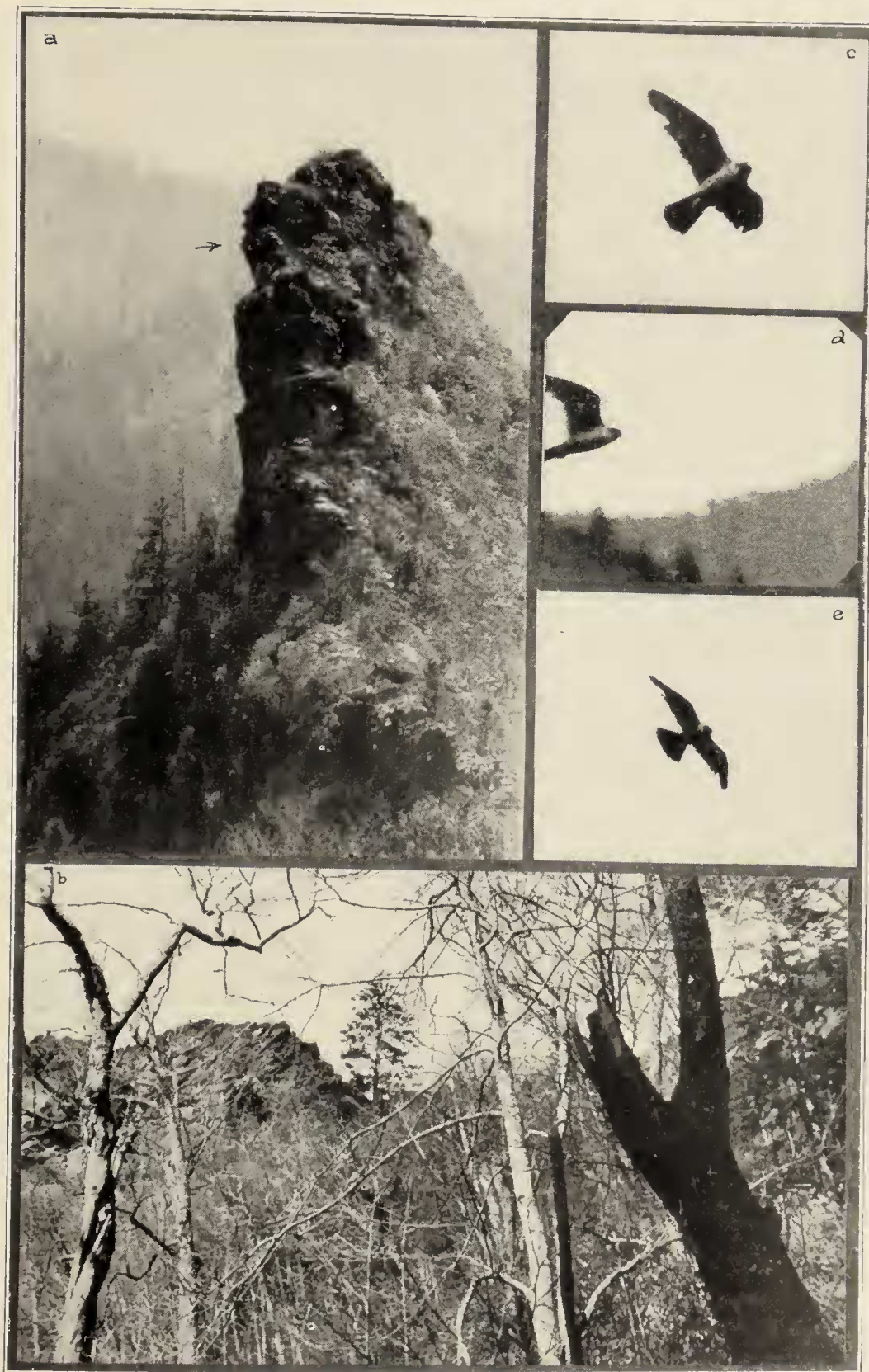


FIG. 1. Nesting crag of the Duck Hawk in the Great Smoky Mountains. a, Profile of cliff. b, Broadside of cliff from 500 feet below. c, d, and e, Duck Hawk in flight, at about 50 feet.

After half an hour the female sought rest on the top of a dead spruce across the canyon, 1,000 feet away, and during the last fifteen minutes of our stay she remained on this perch.

The most easily discernable field marks of the bird in flight were noted to be the pointed wings bent at the elbows, the rather long tail with rounded tips and the large club feet drawn up close under the tail. The eggs, which I collected, are considerably longer than the average. They measure in inches, 2.32x1.61, 2.26x1.67, and 2.21x1.66, averaging 2.26x1.65. Bendire gives the average of sixty-one specimens as 2.06x1.61. Darker markings of rufous overlies a lighter brick red under color but this does not entirely cover the creamy ground and therefore makes this set unusually handsome.

On May 24, 1928, a friend noted these birds noisily circling about the site and got the impression that there were three of them. Two weeks later I visited the site and observed two of the falcons going through their splendid aerial evolutions. For lack of time I did not try to locate the nest on that visit and it is probable that the young had already taken flight.

On the morning of March 30, 1930, I found myself on an escarpment of the Cumberland Mountains looking down, some 800 feet, into the wooded gorge of two tumbling mountain streams which a little further down emptied their waters into the Collins River. This was in Grundy County, Tennessee, some 125 miles west of the Smoky Mountains site. The sandstone cliff on which I stood, "The Point", was that in which I had located an eyrie of the Duck Hawk on May 29, 1922, a description of which will be found in WILSON BULLETIN for March, 1923, page 26.

The birds were not at home, so our party, consisting of Messrs. Mayfield, Monk, Sharp, my son, and myself, began a systematic search of the cliffs which stretched in an unbroken line as far as we could see, keeping a lookout into the half mile wide canyon for falcons on the wing. At one o'clock we decided to lunch at a spring and while my companions were preparing the "grub" I pushed on a quarter mile farther and had the good fortune to flush a male Duck Hawk from a dead limb overhanging the cliff. After a circuitous five minute flight he resumed his perch while I rejoined the party to break the good news.

On our return a short while later the male was still at his post and a few moments after the female flew from her nest, when we had taken a position where we could look across at her from a point about 150 feet away. This nest was unusual, in that the eggs were laid in an old nest of the Red-tailed Hawk built in a recess in the cliff some

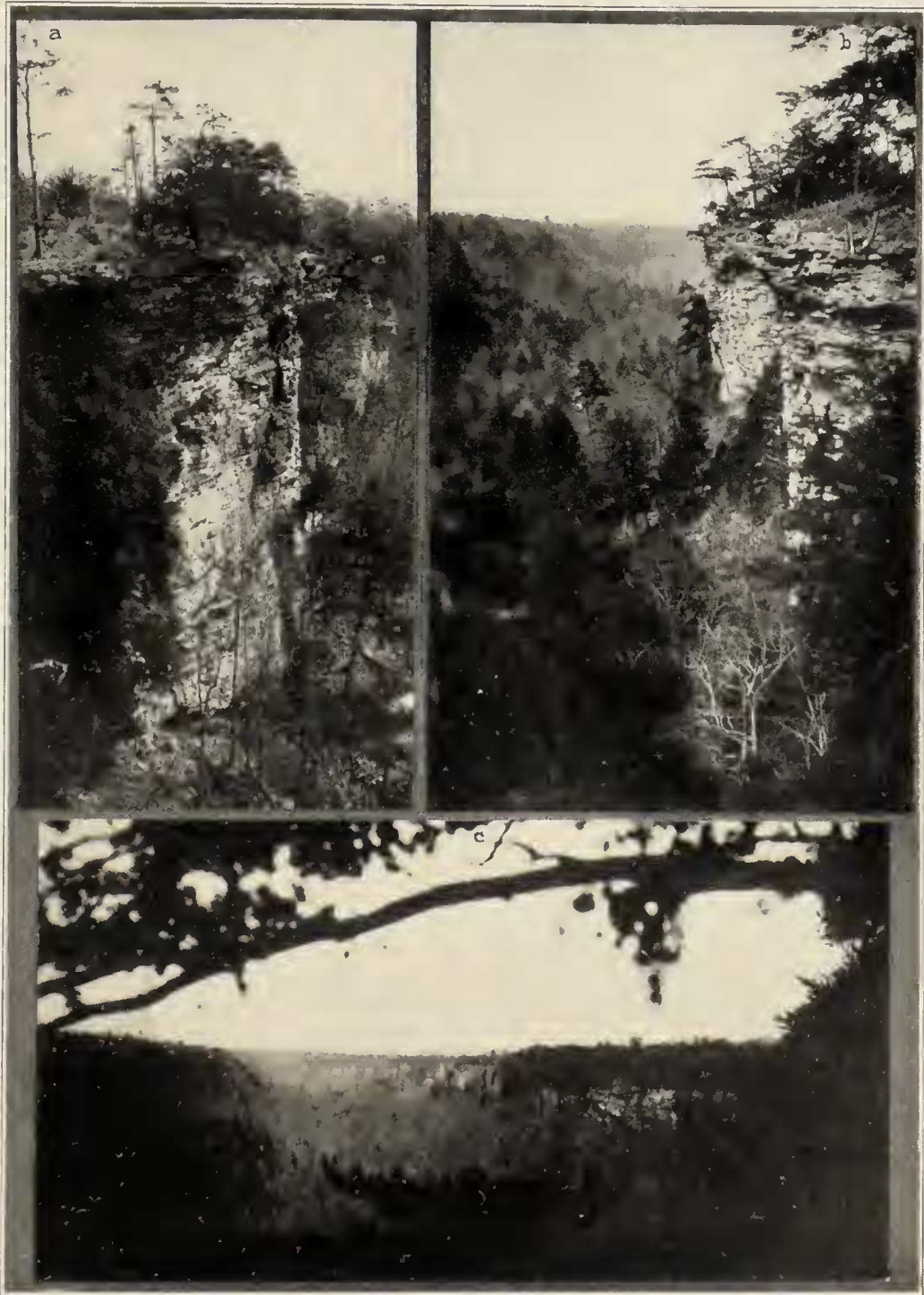


FIG. 2. Nesting cliff of Duck Hawks in the Cumberland Mountains of Tennessee. a, Cliff from the west. b, Cliff from east. c, "Valley of the Peregrines".

ninety feet from the bottom and twenty feet from the top. The brow of the cliff projected about ten feet beyond the nesting ledge and so, even with our rope ladder, we were unable to reach the eyrie. The nesting site is shown in the accompanying illustration. These birds were not nearly so bold as the pair previously described and while both birds remained nearby, in the air, at no time did they dart closer than 150 feet from us. They maintained their cackling notes more or less continuously. On re-visiting the nest a week later it was observed to contain three downy white young nearly a week old. From this it would appear that incubation of the eggs began about March 10. The parent birds were no more bold on this trip than before. From a squirrel hunter, who frequented this cove and who had known of the birds for years, I learned that this pair had nested at the present site for six years, having moved from "The Point" eyrie, a mile away, in 1924. He stated that the latter eyrie had been used prior to 1924 for five or six years to his knowledge. He had never shot at the birds and promised he would endeavor to protect them. Their isolation, some three miles from a good road and two miles from a habitation, will assist in their preservation. He did not know of another pair in the vicinity.

The ledges about both of these eyries, as well as the one in The Smokies, were well marked by white excreta and this serves as an apparently unfailing method of locating a nesting site, at least, one that has been in use for some time.

The pair of Red-tailed Hawks which furnished the nest have definitely formed the cliff nesting habit. In May, 1922, I found their nest with small young a half mile west of "The Point", while in 1930 their nest was found a quarter mile north of it, both being on inaccessible ledges of the cliff.

A nest of the Duck Hawk was found April 4, 1893, by William Wake, three miles below Knoxville in a cliff, the base of which is washed by the waters of the Tennessee River. This nest contained three eggs with incubation well advanced and with measurements averaging 2.15x1.73. (See *Museum*, Vol. 1, No. 3). I am unable to find published records of any other nests having been found in the southern states, although it has been observed at breeding season in a number of places in the Appalachian Mountains. I have searched diligently in many likely localities, but have been unable to locate other breeding pairs than those I have mentioned.

NASHVILLE, TENN.